From: Challenges and Opportunities: From Now to 2001, Howard F. Disbury, Jr. (Editor), Bethesda, Maryland: The World Future Society, 1986.

CRISIS MANAGEMENT TRAINING: PREPARING MANAGERS FOR MINE EMERGENCY OPERATIONS

by

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It is inevitable that each of our lives will be affected by crises at one time or another. On a micro scale, our individual reactions to crisis situations has direct influence upon ourselves, families, friends, and the organizations in which we participate. From a macro perspective, the decisions of world leaders during crisis affects millions of people. These decisions can have direct bearing upon individual health, freedom, and in the extreme case-survival.

Virtually no organization-irrespective of its size, nature of business, or location-is immune from a crisis situation. Emergencies can arise at any time and from many causes, but the effect is always the same-damage to people and property. Planning for emergencies must be accomplished in much the same way as an effective organization plans for its business strategies-as far in advance as possible, with the objective to minimize losses. Profit comes from restoring business back to "normal" within the shortest time-frame practicable. How quickly this occurs is directly related to the effectiveness and abilities of an organization's managers under emergency conditions.

Contemporary management theory supports the contention that managerial style should be contingent upon the interaction between people and situations. Management styles that work in relatively stable environments may be ineffective or dysfunctional in dynamic, high-stress emergency situations.

Effective crisis management requires managers to become highly competent in group dynamics and group problem-solving abilities. Emergency procedures must be reinforced and appropriate knowledge must be learned and shared among key individuals. The most effective and efficient utilization of all resources must be accomplished.

A program has been developed for the improvement of crisis management skills in the U.S. Mine Safety and Health Administration. MSHA's Managerial Emergency Responsiveness Development

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Program (MERD) has been beneficial for the improvement and development of emergency management capabilities utilizing interview and survey feedback techniques, emergency simulations and role playing, assessment center methods with feedback, tutorials, and knowledge tests. Although this program was designed specifically for MSHA managers, the same concept can be applied within any organization.

CRISIS AND CRISIS MANAGEMENT DEFINED

Crisis is mainly characterized by three major elements: Threat, Time, and Surprise (Hermann, 1972). Threat is a potential hindrance to some state or goal desired by an organization or individual. It occurs if the decision makers recognize it and believe that it will hinder attaining goals. Decision time is short when the situation will be altered in the near future, after which no decision can be made, or the decision can be made only under less favorable circumstances. Surprise refers to lack of awareness by the decision makers that the crisis situation is likely to occur, but is not equated with the lack of a planned response to the situation. Even if plans exist, an individual can be surprised. For a crisis to exist, all three elements must be present.

Several authors (Weiner and Kahn, 1962; Miller and Iscoe, 1963) have identified a variety of characteristics associated with a crisis situation:

- A crisis is often a turning point in an unfolding sequence of events or actions;
- A crisis is a situation in which the requirement for action is high in the minds and planning of participants;
- A crisis is followed by an important outcome whose consequences and effects will shape the future of the parties to the crisis:
- A crisis is a convergence of events whose combination produces a new set of circumstances;
- A crisis is a period in which uncertainties about the assessment of the situation and alternatives for dealing with it increases;
- A crisis is a situation in which control over events and their effects decreases;
- A crisis is characterized by a sense of urgency, which often produces stress and anxiety among people;
- A crisis is a circumstance or set of circumstances in which information available to participants is usually inadequate;
- A crisis is characterized by increased time pressures for those involved;
- A crisis is marked by changes in the relations among participants; and
- Crisis increases tension among people.

Crisis management is not mismanagement. Some organizations appear to operate in a continual state of crisis treating each new situation as a surprising, potentially threatening event, calling for quick reactive measures and decisions. These types of organizations are mismanaged, and, as a result, are not capable of managing a true crisis when such a situation arises.

Effective crisis management, on the other hand, is a systematic, orderly response to crisis situations in such a manner that, by pre-arrangement, a specific segment of an organization is designated to

deal with the crisis utilizing any available organizational resources, while the major part of the organization can continue functioning normally. It is a technique, and set of skills, for both avoiding emergencies, and planning for the unavoidable ones, in order to mitigate their unfortunate consequences. Effective crisis management, therefore, mandates development of a set of special skills for managing an organization under conditions of intense stress.

STRESS AND CRISIS MANAGEMENT

Chief among the reported effects of stress on managers are tiredness and sheer fatigue (Horvath, 1959; Lazarus, 1963). If continued for long periods, fatigue leads to increased irritability, to paranoid reactions, to heightened suspiciousness, hostility, and increased defensiveness.

The effect of psychological stress on performance depends, to a large extent, upon the stress reaction based upon individual conditioning, and the complexity of the task to be performed. Mild stress often facilitates performance, especially if responses are uncomplicated or well learned. As stress increases, performance generally worsens; and with very intense stress, complete disintegration of performance can occur. The more complex the task, the more likely that stress will disrupt performance.

If stress is intense and if it persists, there is a tendency for more recent, and usually more complex, behavior to disappear, and simpler and more basic forms of behavior to reappear. Usually such regression involves simplification of basic perceptual and motivational processes within individuals. In the case of motivation, stress has usually been found to activate the more basic survival needs and to minimize those motives located higher up on the hierarchy of human needs.

Shifts in personality traits have also been discovered to occur during crisis conditions. Energetic, active people tend to behave even more energetically and actively under stress. Anxious people become more anxious, repressors repress more-especially if they consider it important to operate that way (Schroder, et al., 1967).

Stress has been found to also affect the way individuals relate to others. Researchers have found that people operating I leader roles who are more task-oriented than human relations-oriented will tend to become much more task-oriented under pressure, until they finally neglect human relations altogether. Also, people who are primarily human relations-oriented will, under sufficient stress, pay less attention to the task and attend more to the human relations involved (Fiedler, 1967).

Along similar lines, a fairly recent study of executive perceptions of corporate crises (Smart, 1980) has examined executive preferences for various managerial styles during normal and crisis situations. The result of this study indicate that executives favor a process management style of task performance during non-crisis periods; however, their preferences shifted toward a specific task direction during crisis periods.

The study went on to report that there was a consensus among executives that a democratic style of management was most suitable during normal conditions; however, during crises, there was a significant shift in preferences toward a more autocratic style.

There was agreement among executives that during normal times it is important to achieve a balanced management style stressing both the human needs and the production goals of the organization. However, there was a significant shift towards preferences for a more problem-solving orientation during crises.

During normal times, most executives agreed that the achievement of job satisfaction for subordinates is an important goal. During crisis, however, there is a highly significant shift away from this norm.

The study indicated that executives were willing to trade-off high employee morale for increased production during crisis: In normal times, high morale is an important organizational goal; however, during crisis, there is a significant shift towards greater emphasis on productivity.

Finally, one other stress-interaction effect can be mentioned at this point concerning delegation of decisions within organizations. When a crisis strikes an organization, there is a tendency for the highest executives and their immediate staffs to become immersed in all the details of the crisis due to the importance of the valuable resources being threatened. Since crisis decision making is typically made by face-to-face groups, middle management groups within the organization tend to become shunted out of the primary crisis decision making process, except for a role in implementing decisions at higher levels. As a crisis lasts longer, or becomes more intense, those at the top of the organizational hierarchy draw more and more decision-making responsibilities to themselves-decisions that would normally be delegated to others. Typically, this tends to shorten lines of communication to operational personnel even further and can possibly lead to alienation (Milburn, 1972).

CRISIS MANAGEMENT DURING MINE EMERGENCIES

Both the Coal Mine Safety and Health and Metal and Nonmetal sub-organizations within MSHA operate district and subdistrict offices throughout the United States which report to the headquarters in Arlington, Virginia. During mine emergency operations, these managers operate within their respective jurisdictions and become MSHA's key on-site representatives. Federal law requires mine operators to notify these persons whenever a significant mine accident occurs. A significant accident is considered to be:

- A fatal injury;
- A mine fire, not extinguished within 30 minutes;
- A mine explosion or ignition;
- A mine inundation;
- An entrapment of any person;
- Any accident requiring mine rescue and recovery; and

- Any physical event at a mine which causes death to persons other than persons on the mine property.

Once a district or subdistrict manager has been notified of a significant accident, he communicates this information to headquarters officials then takes whatever actions he determines necessary to help protect lives of persons involved in the accident and those who are engaged in rescue and recovery activities. Although these managers do have the legal right to supervise and direct the rescue and recovery operations, this extreme authority is seldom exercised. Normally, our managers will act as part of an ad hoc team composed of representatives from the involved mining company, state and local agencies, and the mine workers.

As part of this team, our managers acta as advisors and coordinators while providing federal resources to facilitate emergency operations. Such resources may include: on-site gas analyses, ventilation consultation, mine stability analyses, site communications, seismic location of trapped miners, borehole and rescue drilling, television and borehole probes, and logistics support and personnel. To the fullest extent possible, however, the major responsibility for conducting effective rescue and recovery operations is left with the mining company.

CRISIS MANAGEMENT TRAINING PROGRAM

Since it is mandatory for MSHA managers to play a major role in the effective crisis management of mine emergencies, in 1980, a comprehensive program was initiated to internally assess our organization's emergency response capabilities and the adequacy of managerial training for crisis situations. This objective was accomplished utilizing a combination of in-depth interviews and survey feedback methodologies.

All MSHA district managers and many key members of the headquarters staff were individually interviewed to obtain information regarding past organizational and managerial performance during emergencies. Specifically, issues such as overall emergency performance, adequacy of existing emergency procedures, relationships with internal and external parties, adequacy of emergency training, and organizational policies were addressed.

Several significant issues precipitated from the interview data. This information was consolidated in a questionnaire format and these questionnaires were administered to three groups: district managers, subdistrict managers, and headquarters staff. An extra-ordinarily high response rate of 91% was obtained indicating a high degree of enthusiasm for the program under consideration.

Information from an analysis of the questionnaire results was presented to MSHA headquarters personnel. This information indicated a strong need to develop a crisis management training mechanism which would emphasize emergency problem solving, procedures and role clarification, and provide an exchange of knowledge which would be useful to managers participating in rescue and recovery activities.

Therefore, it was necessary to create a training program which would facilitate the development of crisis management skills and abilities for our managers. Specifically, this required considering training exercises that would incorporate use of group dynamics and group-problem solving techniques. It was also desired to reinforce knowledge and use of MSHA emergency procedures and to share appropriate technical knowledge and experiences among our managers.

The resulting seminar was designed so that it could be implemented within a two-day time period. The format included the following: psychometric, self-evaluation exercises assessing individual learning style, leadership style, and conflict resolution style; group problem solving exercises emphasizing emergency simulations and role playing exercises; emergency procedures exercises and reviews; a knowledge test requiring composite group responses; videotaped individual interview sessions; and several interactive informational presentations.

For this first seminar, three groups, each consisting of two district managers and ten subdistrict managers were formed for group problem-solving and interactive exercises. A competitive atmosphere was created between these groups as they were told how they would be scored on a group performance basis during four exercises: a group problem-solving emergency simulation, an emergency procedure prioritization exercise, role playing during an emergency simulation, and an extensive mine emergency knowledge and information review tests.

Our strategy in developing this program was to combine all previous exercises and presentations designed to provide skills and knowledge that would be utilized by the managers during the role-playing emergency simulations. These simulations are actually the heart of the training program, allowing a dynamic combination of techniques to be utilized consecutively. The exercise is modeled after actual past, or potential emergency situations with the objective of making the situation as authentic as possible. The development of such an exercise requires a team of experts who can provide up-to-date knowledge including: mine ventilation, gas analysis, mine rescue and recovery, drilling, and particular mining conditions and layouts. At several stages throughout the exercise development process, critiques of the technical content of the simulation exercise is encouraged. The ultimate critique of the exercise, however, occurs during a full dress rehearsal and prototype testing of the simulation utilizing members from the same organization from which participants will come. During this stage all final corrections and changes in content or procedures is incorporated into the exercise.

The role-playing training technique gives participants the opportunity to experience problems, explore solutions, and interact with other personalities which may actually exist during actual mine emergency operations. Needless to say, the success of this method is heavily dependent upon the participant's willingness to actually adopt the various roles and behave as persons simulated in the real world.

The success of the exercise is also extremely dependent upon the quality of feedback which can be given to participants when the exercise is finished. This is accomplished in several ways. The primary feedback mechanism is through the use of trained observers. The group of observers is composed of members of the simulation development committee, and those persons who have

helped pre-test the simulations. Observers utilize checklists which are developed simultaneously with the simulation exercise.

Behaviors and actions are noted as the simulation progresses and are consolidated in a meeting of observers after the simulation has been completed. A critique is given to each ground in intragroup feedback sessions, at which time the suggested solution to the exercise is revealed to each group. Detailed feedback is given during these sessions and difficult issues are resolved through a group discussion process. Later in that same day, groups are brought together in an intergroup feedback session where individual groups discuss their solutions with the consolidated group of participants. An additional form of feedback is accomplished at the end of the seminar through the group viewing of the edited videotape consisting of segments from each group's role playing exercise.

PROGRAM EVALUATION

An evaluation of the program was accomplished utilizing a specially designed questionnaire. Managers were queried regarding the degree to which they found the program to be interesting, how helpful they thought the program was, how much they learned about managerial behavior in emergency situations, and the design and coordination of the program. Figure 1 shows the results of the questionnaire survey.

As can be seen, there was an overwhelming positive response to the program. Responses to more detailed questions revealed that the managers obviously liked the emergency simulations best out of all the seminar activities. Improvement recommendations included need for more detailed simulations and more specific feedback from experienced individuals.

As you may now realize, the managers were not the only ones to receive feedback. Feedback must flow both ways if a program is to be improved and valued.

Figure 1:

Evaluation Questionnaire

Purpose: The purpose of this questionnaire is to obtain your honest opinion of the Mine Emergency Readiness Development Program you recently completed. In addition to five (5) prepared questions in Section 1, there are five (5) questions in Section 2, which provide an opportunity for you to express yourself more fully.

Section 1. (5 questions) (Mark only one (1) answer for each question, place an X on the bar in front of your answer.)

1.	Did you find the Program interesting?	30	Almost Always	88%
		4	Somewhat	
		0	Seldom	
2.	In a general way, how helpful do you thing the Program was to you?	28	Very Helpful	93%
		6	Helped Some	
		0	A Waste of Time	
3.	How much id you learn about management behavior in emergency situations?	20	A Great Deal	59%
		13	Some	
		1	Very Little	
4,	Did the coordinators offer clear explanations of the activities?	31	Almost Always	91%
		3	Somewhat	
		0	Seldom	
5.	Was there enough group discussion of the activities?	1	Too Much	91%
		31	About Right	
		2	Not Enough	

PROGRAM IMPROVEMENT MODIFICATIONS

It has now been four years since our initial MERD program was implemented. Four iterations of the MERD program have now successfully been completed for Coal, and three iterations for Metal and Nonmetal. The brief discussion which follows covers modifications made to improve the program and key things learned along the way to aid the development of future programs.

MSHA remains committed to the philosophy that simulation exercises should be built upon knowledge supplied during preceding presentations, thus, the first day of our seminar is devoted entirely to informational presentations.

In past seminars, the simulation exercises were the most popular activity essentially giving the managers what they wanted. The simulations in our first seminar were conducted during a two-hour period. Now, our simulations are held during a five-hour period through the morning and lunch,

with feedback sessions and additional presentations conducted in the afternoon. While are first exercises only simulated surface conditions, our exercises now simulate both surface and underground conditions. Also, the total seminar length has now been expanded from two to three days, allowing us to run two complete simulations. A mine fire problem is conducted during the second day of the seminar, and a mine explosion exercise is performed during the third day. A listing of roles played during each exercise is shown in Figure 2.

Feedback sessions have also been expanded to one hour each for intragroup and intergroup discussions, and the quality of feedback has also improved since our initial seminar through the use of more detailed checklists and better observational techniques. It seems that our managers literally thrive on feedback, and no matter how much feedback time is planned into our agenda, there are always requests for more.

In conclusion, here are some key factors to be considered if you are thinking about developing a program similar to ours for your organization. First, it is extremely important to spend adequate preparation time and to utilize all available organizational resources to assure a quality product. Lack of organizational commitment, time, and resources will invariably lead to a crisis in the program you attempt to create-confusion and uncoordination efforts will result. As in all worthwhile similar endeavors, what people get out of a program is directly proportional to the quality and amount of effort that goes into the development process.

Our second bit of advice is to get everybody involved. Utilize the unique sources of expertise that exists within your organization. Experts should be used as key members of the development committee. Include the invaluable experience of such experts for informational presentations-build them into your agenda.

Thirdly, when you develop a crisis management program, it is wise to build in a flexibility that allows most or part of the program to be transmitted or utilized in other parts and levels of the organization. For example, although our program focuses upon the development of District and Subdistrict managers, simulations from these seminars have been reused and conducted for supervisors, inspectors, and members of our mine rescue teams.

Finally, it is of utmost importance to keep in touch with your managers to be aware of their continually changing training needs. Ideally, a needs analysis should be performed on a regular basis utilizing interview and survey feedback techniques. As a person grows within an organization, they need change. While a program was successful two years ago, it may be found to be repetitious or boring today. Ideally, crisis management programs should be conducted on an annual or bi-annual basis. Our program is continually challenged to supply interesting and useful information for our managers to help improve their skills and abilities-to make them better crisis managers.

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Figure 2:

Listing of Mine Fire Roles

Role			
Surface Personnel	Group I	Group II	Group III
Mine Superintendent and Spokesman			
State Representative			
Representative of the Miners			
Safety Director Telephone			
Recorder			
Underground Personnel (Fresh Air Base)			
Mine Foreman 1			
Mine Foreman 2			
Briefing Officer 1 (Section Foreman)			
Briefing Officer 2 (Section Foreman)			
State Representative			
MSHA Representative			
Representative of the Miners			
Recorder			
Mine Rescue Team			
Captain - Team 1 & 3			
Captain - Team 2 & 4			
Rescue Team Controllers			
Fresh Air Base Controllers			
Fresh Air Base Evaluators			
Surface Controllers			

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